

15 octobre 2024

Series 5 : Analysis of the Menchutkin's experiment results

For the response K , the rate coefficient, which is a dimensionless factor influencing the reaction rate and given in the last column of table 1 :

1. Infer the coefficients for the three models analysed in the exercise of last week (series 4),
2. Compute the ANOVA tables for the three cases (`fitlm()`, `anova mdl`),
3. Compute the confidence intervals of the coefficients,
4. Confront the results of the inference with the analysis of the design.

TABLEAU 1 – Coefficients of induction σ_F , of resonance σ_R of 19 amines and reaction rates K obtained in the Menchutkin's reaction

Run	Amines	σ_F	σ_R	K
1	H	0	0	4390
2	t- C_4H_9	0	-0.07	4180
3	i- C_3H_7	0	-0.07	4060
4	C_2H_5	0	-0.07	3950
5	CH_3	0	-0.08	3850
6	CH_2OH	0.14	-0.06	3510
7	C_6H_5	0.1	-0.22	3350
8	$CH=CH_2$	0.06	-0.15	3260
9	NH_2	0.14	-0.52	2600
10	$NHCH_3$	0.12	-0.58	2520
11	$N(CH_3)_2$	0.1	-0.64	2250
12	OH	0.3	-0.38	2110
13	$CO_2C_2H_5$	0.31	0	2020
14	OCH_3	0.28	-0.42	1700
15	Br	0.45	-0.15	1290
16	Cl	0.45	-0.17	1230
17	F	0.44	-0.25	1060
18	CN	0.6	0	1000
19	NO_2	0.65	0	660